Cancer Patients and Pilgrimage to Makkah for Hajj or Umrah

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Abstract

Pilgrimage to Makkah for Hajj is the fifth pillar of Islam. It is compulsory once in life only on physically and financially capable adult Muslims. Almost, 7.5 million Muslims are living with cancer within 5 years of diagnosis. Some of them may wonder whether they are medically allowed to perform Hajj or Umrah. Spiritual mass gatherings including Hajj and Umrah have benefits. However, they entail non-communicable and communicable health risks. While non-communicable risks may be similar, communicable risks are higher in cancer patients compared to the usual pilgrims. Stable cancer patients who completed their therapy more than 3-6 months before may be allowed to perform Hajj or Umrah if they lack significant toxicities particularly bone marrow or immunity suppression. Patients on hormonal or oral targeted therapies may perform Hajj or Umrah while continuing their therapies. Delaying or interrupting specific cancer treatments may be detrimental. Curative or adjuvant therapies should not be delayed or interrupted to allow for Hajj or Umrah particularly for aggressive, advanced, or high-risk cancers. Palliative therapies may be delayed or interrupted to allow for Hajj or Umrah after thorough discussion that considers treatment goals and patient wishes and priorities. Cancer patients going for Hajj or Umrah should have thorough health assessment, receive Hajj-specific health education, and carry a detailed medical report. They may need additional vaccinations or use antimicrobial prophylaxis. As much as possible, they are advised to avoid crowding, perform rituals by night, use proxy and stay in Hajj areas for the shortest time.

INTRODUCTION:

Hajj or Pilgrimage to Mecca/Makkah is the fifth pillar of Islam (1). Allah said that “pilgrimage to the House is a duty owed to Allah by all who can make their way to it. As for those who refuse to follow His command, surely Allah does not stand in need of anything” (2). Prophet Mohammad said that “the well-performed Hajj has no reward but Paradise“ (3). Hajj is imposed once in life only on adult Muslims who are physically and financially able to go to Makkah. Financial ability ensures that Muslims take care of their families first. Physical ability exempts those who cannot endure the rigors of the activity and the extended travel (4). With improvements in travelling and medical facilities, many of those previously deemed physically ineligible for Hajj may now do it with a sustainable effort.

In 2010, Muslims constituted 23% of the 6.9 billion world population and their numbers would be comparable to Christians by 2050. They are expected to make up 10% of the population of Europe, 5% of Australia, 2.7% of New Zealand and 2.1% of USA (5). In 2015, almost 100,000 Europeans, 60,000 Turkmens, 14,000 Americans, 3000 Canadians and 3000 Australians performed Hajj (6). If Muslims' share in cancer prevalence (7) is equivalent to their percentage in the world's population, then there will be almost 7.5 million Muslim people living with cancer and distributed throughout the world.

Throughout the year and particularly at the time of Hajj, many Muslim cancer patients would financially afford the expenses of the Hajj or Umrah trip. They may ask physicians whether they are medically allowed to perform Hajj or Umrah. Currently, there is no clear guidance to the answer and this review provides our view on the topic.

BENEFITS OF HAJJ and UMRAH

Mass gatherings, including pilgrimage, can entail significant health risks. However, the benefits for well-being also need recognition (8). Participation in long-duration mass gatherings showed continuing improvements in well-being, anxiety and depression with exceptional cures of some diseases including cancers (8-10). Though impressive, these cures are currently beyond the ken and await scientific explanation. Significant mental factors exist including anticipation and hope, belief and confidence, fervor and awe, meditation and exaltation. These are compounded by the spiritual atmosphere of the place, ritual gestures, hymns, and prayers (10).

Muslims do believe that Hajj and Umrah have many religious benefits. They are ways to paradise, forgiveness of sins and answering supplications (3, 11). Additionally, there are many other presumed benefits. These include psychological, physical, health and social benefits (12).

HAJJ SUMMARY:

Hajj is performed in Makkah during day 8 to 13 of the 12th lunar month (Dhul-Hijja) (4). At day 8, pilgrims go to Mina and spend the whole day and night. At dawn of day 9, they begin a journey to Arafat and spend the day there. After sunset, they go to Muzdalifah where they spend the night. At sunrise of day 10, they go back to Mina to perform several Hajj rituals, including stoning Jamaraat, shaving head, making sacrifice, and performing Tawaf Ziarat (going around the Kaaba). They stay in Mina for 2-3 days, during these days everyday they perform the stoning of the Devil symbol at Jamaraat. Thereafter, pilgrims go to the Holy Mosque to perform Tawaf Wida. Then, pilgrims may leave Makkah completing their Hajj (13).

OVER-CROWDEDNESS AND WEATHER DURING HAJJ:

The livable area of Makkah is 88 square Kilometers (Km2) with more than 1.5 million permanent residents (14). The areas of Arafat, Muzdalifa, Mina and Holy Mosque are 13, 12, 8 and 0.25 Km^2, respectively (15). Pilgrims' number exceeded three millions in the year 2012 G/1433 H (16). During Hajj, they become extremely overcrowded particularly in the Holy Mosque during prayers, Tawaf and Saee. The population density may reach seven persons per square meter of land (17).

As the Islamic calendar is lunar (13), it is almost 11 days shorter than the solar year. Thus in a period of 33 solar years, the Hajj month of Dhul-Hijja will circulates throughout the 12 solar months with a whole range of weather seasons (18). Makkah is 277 meter above the sea level (15). It is very hot in Summer with a temperature that may exceed 50 ^{0}C and it is warm in Winter with a temperature that may go as low as 10 ^{0}C (19).

HEALTH RISKS DURING HAJJ:

Hajj is one of the largest, most culturally and geographically diverse mass gathering attracting pilgrims from over 183 countries (13, 16). It challenges public health capacities not only in KSA where pilgrims carry their diseases to, but also to pilgrims' countries when pilgrims carry new diseases that may be acquired during Hajj (20). During Hajj, the person's life routine changes as one travels to a new place for a period up to 4-6 weeks where geography, weather, diet, and habits are different (21). They may be exposed to many risks that are classified as communicable and non-communicable.

Communicable risks in the general pilgrims:

Pilgrims carry with them their prevalent pathogens and the over-crowdedness increases infection transmission probability. Transmission routes are primarily air-borne and droplet. Ingestion and direct contact are possible routes (22). The commonest pathogens are viruses followed by bacteria and occasionally fungi. Antibiotic resistance in Makkah is very high (23).

Respiratory infections represent 60% of presentations to caravan physicians and pneumonia represents 15-40% of Makkah's hospital admissions (24). Respiratory viruses come first with bacteria are often secondary. The common viruses are Adenoviruses, Rhinoviruses and Influenza in 36, 30 and 20%, respectively. The common bacteria are intestine bacillus, Chlamydia pneumonia, Haemophiluses and Streptococcus in 19, 16, 9 and 8%, respectively (25). Compared to pre-Hajj, post-Hajj nasal colonization by viruses and bacteria increases from 7 to 45% and from 15 to 31%, respectively (26). Up to one third of pilgrims may acquire new viruses or bacteria during the period of Hajj (27) and the Middle-East Respiratory Syndrome (MERS) caused by corona-virus is a major concern (28).

Diarrhea and gastroenteritis may affect 23% and 8% of pilgrims, respectively (29). Some gastroenteritis outbreaks were caused by consuming food kept at an unsafe temperature without being reheated (30). When septicemia is encountered, Gram-positive organisms constitute 57%. Staphylococci is the commonest followed by E. coli and Pseudomonas (23). Uncommon risks include meningitis, brucellosis, tuberculosis, malaria and zoonotic diseases during slaughtering (31) (32) (33) (34).

Fungal or bacterial skin infections represent 5% of diseases during Hajj (35). Chafing, foot blisters and erythema are predisposing factors (36). Contact infections may occur while walking bare-footed during prayers, Tawaf and Saee. Head-shaving using unclean non-disposable non-sterile blades can transmit blood-borne pathogens, such as hepatitis B or C, and human immune-deficiency viruses (HIV) (13).

These communicable risks increase with prolonged stay in over-crowded Hajj areas, old age and co-morbidities e.g. diabetes mellitus or chronic lung diseases and with immune-suppression e.g. HIV, allogeneic organ/tissue transplantation or neutropenia (30, 37, 38).

Communicable risks in cancer patients:

Because of the cancer or its treatment, cancer patients usually have B- and T-immune suppression (IS) which is exaggerated by older age, co-morbidities and nutritional deficiencies (39). While low-dose corticosteroids, methotrexate, azathioprine and 6-mercaptopurine can result in low-level IS, high-level IS can be caused by high-dose corticosteroids, intensive chemotherapy, allogeneic stem-cell transplant (SCT) particularly with chronic graft versus host disease (cGVHD) and immune modulators such as rituximab (40). IS increases infection risks whether opportunistic e.g. cytomegalovirus reactivation and pneumocystis jirovecii pneumonia (PJP) or community acquired e.g. invasive pneumococcal disease and influenza. In cancer patients, properly applied vaccination can prevent some infections (41) and their side effects may be comparable to healthy individuals (42).

Non-communicable risks:

Hajj is arduous even for the young healthy pilgrims. Most international pilgrims fly into Jeddah but some may come by ship or even by cars. Then, they take a bus to Makkah (13). While women can perform Hajj wearing simple attires covering the whole body except the face and hands, men wear two seamless pieces of un-hemmed white cloth without directly covering the head (4). By foot or by bus in the very crowded roads, pilgrim travel 8 km to Mina and further 14 km to Arafat at daytime. By night, pilgrims begin a 9-km back journey to Muzdalifah and sleep in the open air. At Dawn, they go back to Mina and stay there for 2-3 days. At the Holy mosque, Tawaf and Saee can take many hours (4). During Hajj, pilgrims are exposed to crowding, traffic congestions, steep inclines, rough ground underfoot, as well as physical stressors as heat and sun and occasionally cold, winds or rains (43).

Despite the excellent measures taken by the Saudi authorities to minimize pilgrims' sufferings (44), still there are potential risks. Long rituals of standing and walking in the heat may cause chafing. Foot blisters or erythema and musculoskeletal pains afflict 50% and 20% of pilgrims, respectively (36, 45). Pilgrims are at risk of heat/sun-related illnesses e.g. heat strokes, heat exhaustion and dehydration especially in summer. Spending the nights outdoors may predispose pilgrims to cold-related diseases in winter. Over-crowdedness poses potential hazards particularly motor vehicle accidents and deadly stampedes. Fire-related burn injuries and accidental hand injury during animal slaughter may also occur (34).

Cancer patients may be more prone to non-communicable risks compared to the usual pilgrims. They are generally older, may have fatigue related to cancer or its treatments and they may suffer various treatment-related adverse events.

WHICH CANCER PATIENT MAY GO FOR HAJJ OR UMRAH?

Important factors to consider are the patient characteristics including performance status and co-morbidities, the specific cancer and its treatments.

A. General considerations:

From the medical point of view, cancer patients may be allowed to go for Hajj or Umrah if/when:

1. Treatment delay is not detrimental to their curable disease.
2. No cancer or treatment-related sequalae that preclude Hajj or Umrah particularly bone marrow or immunity suppression.
3. No other concomitant diseases that preclude Hajj or Umrah.
4. Treatments completed 4-6 months prior to Hajj.
5. The subject is stable, with good performance status and able to self-care or has sufficient arrangements for that.
6. Staying in Makkah for the shortest possible time if their risks are high or if treatments need to initiate or resume.
7. Taking the acceptable waivers to minimize the risks they may be exposed to.

B. Specific considerations based on the type of cancer and treatments provided:

Both timing and risks need consideration. By timing we mean the timing of Hajj or Umrah in relation to the treatment i.e. before, during or after therapy. Risks can be cancer-related or Hajj-related. Cancer-related risks include poor outcomes (e.g. increased morbidity or mortality) with delaying or interrupting treatments. Hajj-related risks include the communicable and the non-communicable risks. Patients with low cancer-related risks may include those with early stage and indolent cancers. Patients will high cancer-related risks may include those with advanced stage or aggressive cancers. Patients with low Hajj-related risks may include those who recovered adequately from the cancer and its treatment-related complications and side effects. Patients with high Hajj-related risks may include those who have significant residual complications and side effects related the cancer or the treatment particularly immune or bone marrow suppression.

1. **Surgical patients**: Trauma, acute appendicitis, diabetic foot and complicated hernias were the most common reasons for admission to surgical wards in Makkah hospitals (46).

   A. ***Cancer patients asking to go for Hajj or Umrah before surgery***:

   Curative surgery (e.g. mastectomy and colectomy for localized cancers) should not be delayed to allow for Hajj or Umrah particularly if this delay is prolonged (47). This may be particularly true for high-risk, advanced or rapidly growing cancers (48) (49) . Delay in surgery for low-risk disease e.g. low-grade prostatic cancer was not associated with pathological upstaging or increased mortality (50).

B. Cancer patients asking to go for Hajj or Umrah after surgery:

Following cancer resection, patients may be allowed to go for Hajj or Umrah after sound wound healing and adequate resolution of surgical complications. This may take several months following major oncologic surgery particularly in the region of the chest or abdomen

Medical Oncology patients:

Some systemic therapies for early or advanced cancers (e.g. hormonal therapies and oral targeted therapies) need not to be delayed or interrupted while doing Hajj or Umrah. However, patients should be educated regarding their disease and its treatment, lack severe toxicities, have adequate supply of the drug, are knowledgeable of the treatment side-effects and know what to do should they happen.

C. Cancer patients asking to go for Hajj or Umrah before starting chemotherapy or other systemic therapies:

Curative primary chemotherapy (e.g. treatment of acute leukemia and some lymphomas) should not be delayed to allow for Hajj or Umrah. Aggressive or high-risk cancers should start adjuvant systemic therapy as soon as possible (49). Adjuvant chemotherapy for low or intermediate-risk cancers may be delayed for a short period provided that the oncologic outcomes are not compromised. While starting adjuvant therapy within 60 days of breast cancer diagnosis may not undermine disease-free or overall survival (51), longer delays may be detrimental (52). Patients receiving palliative chemotherapy may delay its onset to allow for Hajj or Umrah after a thorough discussion between the patient and the medical oncologist to settle out treatment goals and patient’s priorities.

D. Cancer patients asking to go for Hajj or Umrah during chemotherapy or systemic therapy:

Interruptions of primary or adjuvant systemic therapies to allow for Hajj may not be recommended as it may be detrimental (52). Palliative chemotherapy may be interrupted after a thorough discussion between the patient and the medical oncologist to settle out treatment goals and patient’s priorities.

E. Cancer patients asking to go for Hajj or Umrah following completion of chemotherapy or systemic therapy:

Patients who completed their therapies may be allowed to perform Hajj or Umrah if they adequately recovered from treatment-related side-effects particularly myelo-suppression and immune suppression. A period of 3-6 months may be reasonable.

2. **Radiotherapy patients**:

   A. **Cancer patients asking to go for Hajj or Umrah before starting radiotherapy:**

   Patients with aggressive or high-risk disease should start planned radiotherapy as soon as possible. Commencing radiotherapy for low or intermediate-risk disease may be delayed to allow for Hajj or Umrah provided this will not compromise oncologic outcomes. Compared to shorter delay, time from diagnosis to start radiotherapy longer than 45 days was not associated with poor survival in cervical or head and neck cancers (53)(54). Patients receiving palliative radiotherapy may delay its onset provided that the matter is thoroughly discussed between the patient and the radiation oncologist to settle out treatment goals and patient's priorities.

   B. **Cancer patients asking to go for Hajj or Umrah during radiotherapy** :
   It is advisable that patients receiving curative or adjuvant radiotherapy (e.g. cervical and head and neck cancers) may not interrupt their daily treatments to allow for Hajj or Umrah as this has proven to be detrimental (55).

   C. **Cancer patients asking to go for Hajj or Umrah after completing radiotherapy:**

   Patients developing radiation-related complications may not be allowed to go for Hajj or Umrah till they reasonably recover. Areas previously irradiated should be protected from sunlight with adequate skin care measures.

3. **Palliative care patients:**

   Goals of care and patients' wishes should be considered. Palliative care patients may be allowed to perform Hajj or Umrah if they feel they can physically tolerate it. Every effort should be exerted to keep them palliated during the event. This includes, but not limited to, providing adequate management of their symptoms including pain control.

HEALTH ADVICE FOR CANCER PATIENTS GOING FOR HAJJ OR UMRAH:

Many of the infectious and non-infectious hazards during Hajj can be avoided or averted by adopting appropriate prophylactic measures (34). These may include:

1. **Pre-Hajj Heath assessment:**

Medical providers should perform functional assessment, identify each person's unique risks and tailor a mitigation plan. They advise on common respiratory conditions, assess respiratory fitness, arrange necessary vaccinations, adjust the usual medical regimens, prescribe adequate medication supplies (56).

2. **Health Education** on the preventive measures, symptoms that should prompt urgent medical attention (13) and antimicrobial prophylaxis and treatment.
3. **Medical report**:
   a. Language barrier and non-availability of translators in Makkah medical facilities during Hajj may exceed 50% (30). Thus, pilgrims are advised to have a detailed medical report preferably in English clearly stating the diagnosis, stage, pathology, treatment details

including possible side-effects and how to deal with them, and the contacts of the responsible physician. It is also import to know the hospitals in Makkah that have facilities dealing with cancer.

4. **Immunization:**

   a. Owing to their weak immune response, a period of 6 months should elapse before vaccinating patients receiving intensive chemotherapy (ICT) or anti-B-cell antibodies. For fear of vaccine-induced disseminated disease, live vaccines should be avoided while on chemotherapy or < 24 months following SCT. Inactivated or live vaccines can be given 3 months following non-ICT and 6-12 months following SCT, respectively (40) (57). Inactivated vaccines can be given 3 months following non-ICT whereas Live vaccines may be given after 24 months in absence of cGVHD or IS (57).

   b. Cancer patients willing to perform Hajj should receive the mandatory immunization unless clearly contraindicated. These include meningococcal meningitis and seasonal influenza vaccine (including H1N1) for all patients (58). Pneumococcal polysaccharide vaccine is required for pilgrims aged ≥ 65 years and for younger pilgrims with co-morbidities including cancer patients (13)(59). Yellow Fever and killed Poliomyelitis vaccines are necessary for those coming from endemic areas (58).

5. **Antimicrobial prophylaxis (AP) and self treatment:**

a. AP may be used to prevent infection by exogenous or endogenous organisms (60). It is not a substitute of vaccination. It may be used in patients at high-risk of infectious complications if a vaccine is no available or available but contraindicated or with incomplete strain coverage. AP may be used in vaccinated subjects during certain outbreaks e.g. meningitis or influenza. In addition to the presumed benefits, AP has the risks of untoward effects and increased resistance. Antibacterial AP and its duration vary with the presumed disease to be prevented and the oral forms are preferred. Indications that may be relevant here include AP for influenza, meningococcal disease, cellulitis in patients with lymphedema, traveler's diarrhea, Streptococcus infections in asplenic patients, bite wound infections, pertussis and prevention of surgical site infections. Influenza AP includes the use of oseltamivir or zanamivir (54). Ciprofloxacin can be used in various settings e.g. meningitis, traveler's diarrhea and febrile neutropenia or bite wound infection (in addition to amoxicillin-calvulanate) (61). Penicillins may be used in cellulitis and pneumococcal diseases (60). Trimethoprim/sulfamethoxazole may also be used for PJP prophylaxis (62). In contrast to AP, self treatment initiates treatment with the occurrence of the possible symptoms. Many of the mentioned AP can be also used as self treatment.

6. **Religious advice:**

   a. It is advisable that cancer patients going for Hajj or Umrah take advantage of acceptable waivers of religion rules to minimize heat exposure, and maximize personal protection (63). Some rituals may be performed at night to avoid daytime heat, at non-peak hours to avoid crowding or be handled by proxy. Hair may be trimming rather than shaved (58, 64).

7. Complying with the general public health guidelines:

These aim to prevent the spread of infections particularly respiratory infections. They include washing hands with soap and water or disinfectant, especially after coughing and sneezing, using disposable tissues when coughing or sneezing and disposing them in a waste basket, avoiding hand contact with the eyes, nose and mouth, avoiding direct contact with infected persons and sharing their personal gadgets, wearing masks, especially when in crowded places (58). It was shown that simple face masks may decrease influenza-like illness from 53% to 31% among contacts of infected cases (65). Recommendations also include maintaining good personal hygiene, preventing skin infections by light non-restrictive and frequently changed clothes, keeping dry skin, using talcum powder, and being aware of any pain or soreness caused by garments, disinfecting and covering sores or blisters, protecting feet when bare, shaving heads at licensed barbers and using disposable single-use blades (58), staying hydrated, wearing sunscreens, seeking shade when possible and using umbrellas and avoiding the most densely crowded areas (58). Using safe or bottle water is important and when in doubt water may be boiled or filtered (13).

UMRAH

In contrast to Hajj, Umrah is optional. It may be performed at any time of the year and hence the number of pilgrims is spanned over a longer period with less crowdedness except during the month of Ramadan. While Hajj is performed in days to weeks, Umrah is performed in few hours as it entails only Tawaf and Saee. The efforts exerted are less.

Pilgrims can choose the time of Umrah when crowdedness and atmosphere are suitable. Non-communicable risks e.g. sun/heat or cold related illnesses and stampedes are less. Communicable risks are still there, but they may be lower than those during Hajj.

Recommendations and advices for Hajj also apply for Umrah. However, physicians may be less restrictive as the risks are lower and there is more control on the timing and duration. Moreover, the Umrah may be done without modifying therapies or with just a brief interruption for very few days. This brief interruption (e.g. delaying a chemotherapy course for a week or so) should be discussed between the patient and the physician after considering the risks.

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